

1 WHAT IS CLAIMED IS:

1 1. An apparatus for executing a block program comprising:  
2 a block table listing a plurality of records corresponding to a plurality of  
3 blocks in the block program;  
4 a block library for holding a plurality of algorithms associated with said  
5 blocks; and,  
6 means for executing said blocks in said block program in accordance with  
7 said associated algorithms;  
8 wherein said executing means selectively executes said blocks in the  
9 block program that receives a new input value which is different from a previous input  
10 value.

1 2. The apparatus as defined in claim 1 further including an execution  
2 image file for storing descriptions of said blocks and connections between said blocks.

1 3. The apparatus as defined in claim 1 further including means for  
2 inputting/outputting data to and from said executing means.

1 4. The apparatus as defined in claim 1 wherein each of said records in  
2 said block table includes a field indicating whether a corresponding one of said blocks is  
3 to be executed by said executing means.

1 5. The apparatus as defined in claim 4 wherein each of said records in  
2 said block table further includes,  
3 a field for indicating the type of function performed by said corresponding  
4 one of said blocks, and  
5 a field for identifying said corresponding one of said blocks.

1 6. The apparatus as defined in claim 5 wherein each of said records in  
2 said block table further includes,  
3 at least one field for identifying at least one output connector connected to  
4 said corresponding one of said blocks,

5 at least one field for identifying at least one input connector connected to  
6 said corresponding one of said blocks,  
7 at least one field for storing an input value of said corresponding one of  
8 said blocks, and  
9 an output value field for storing an output value of said corresponding one  
10 of said blocks.

1 7. The apparatus as defined in claim 1 further including a connector  
2 table listing a plurality of records of a plurality of connectors for operatively connecting  
3 said blocks.

1 8. The apparatus as defined in claim 7 wherein each of said records in  
2 said connector table includes a field identifying one of said blocks to which a  
3 corresponding connector is connected at a first end, and at least one field for identifying  
4 at least one of said blocks to which said corresponding connector is connected at at  
5 least one second end.

1 9. A method for executing a block program comprising the steps of:  
2 creating a block table of plurality of block records that correspond to a  
3 plurality of blocks used in the block program;  
4 creating a library for holding a plurality of algorithms for executing  
5 functions associated with said blocks;  
6 selectively setting a flag in said block records when at least one input  
7 value of corresponding said blocks changes; and  
8 executing said algorithms of said blocks in said block program having  
9 corresponding block records that have said flag set.

1 10. The method as defined in claim 9 further including the step of  
2 creating a connector table of records that correspond to connectors for operatively  
3 connecting said blocks.

1 11. The method as defined in claim 10 further including the step of  
2 subsequently setting a flag in said records corresponding to said blocks that are

3 connected to at least one output of said blocks that have been executed, if a value of  
4 said at least one output of said executed blocks has changed.

1 12. The method as defined in claim 11 wherein said step of  
2 subsequently setting said flag includes the steps of obtaining an identification of a  
3 connector corresponding to said at least one output of said executed blocks from said  
4 block records corresponding to said executed blocks, and obtaining an identification of  
5 blocks that are connected to said connector.

1 13. The method as defined in claim 10, wherein said block table and  
2 said connector tables are created from an execution image file storing said records for  
3 said blocks and said connectors.

1 14. The method as defined in claim 9 wherein said executing step is  
2 performed at every predetermined time interval.

1 15. The method as defined in claim 9 wherein said records in said block  
2 table are listed in an order corresponding to a predetermined order in which said blocks  
3 are adapted to be executed in said block program.

1 16. The method as defined in claim 15 wherein said executing step  
2 includes a step of checking each record in said block table in said listed order for said  
3 block records having said flag set.

1 17. A controller having a block program for controlling at least one  
2 device in a control network, comprising:

3 a block table listing a plurality of records corresponding to a plurality of  
4 function blocks in the block program, said blocks each having at least one input for  
5 receiving an input value and at least one output for outputting an output value;

6 a connector table listing records of connectors for operatively connecting  
7 said blocks;

8                   a block library for holding algorithms associated with said blocks; and,  
9                   means for executing said blocks in said block program in accordance with  
10 said associated algorithms;  
11                   wherein said executing means selectively executes said blocks in the  
12 block program that receives a new input value which is different from a previous input  
13 value.

1                   18.    The controller as defined in claim 17 further including means for  
2 inputting data to said executing means from the devices and the control network, and  
3 outputting data to the devices and the control network from said executing means.